

## Objective and perceived arousal in social contexts: Social anxiety or anxiety sensitivity?

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## Background

## Social anxiety

- Fear, discomfort, worry, or concern about present or future social situations
- Common (27-40%)<sup>1</sup>
- State vs. trait

1: Kessler et al, 1998

## Social Anxiety Disorder (SAD)

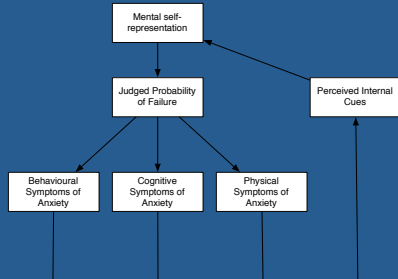
- Most prevalent of anxiety disorders
  - (~12% lifetime)<sup>1</sup>
- Develops early, persists, few seek treatment
- High disability and burden
  - e.g., less working hours, higher rates of suicide, lower educational and occupational success

1: Kessler et al, 2008

## Maintenance of SAD

- Cognitive-behavioural models
  - Clark & Wells, 1995
  - Rapee & Heimberg, 1997
  - Hofmann, 2007

## Maintenance of SAD



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- Objective ANS arousal (i.e., measured by equipment)
  - Only half of investigations report differences
- Perceived ANS arousal
  - Findings are unequivocal
    - Studies finding no differences in objective ANS arousal find differences in perceived arousal

## Anxiety sensitivity (AS)

- Fear of anxiety related symptoms (e.g., running thoughts, increased heart rate) based on the belief that they will have harmful consequences
- Amplifies anxiety responses
  - Fear of fear
- AS associated with SAD

## AS and arousal

- No systematic relationship between AS and objective ANS arousal
- However, AS is associated with greater perceived arousal

## AS, social anxiety, and arousal

- No study has examined AS, social anxiety, and arousal conjointly
- AS as potentially explaining relationship between social anxiety and (exaggerated) perceived arousal
  - AS as contributing to maintenance of SAD by exacerbating symptoms of anxiety

## Purpose

- Clarify the relationships between
  - ANS arousal
    - Perceived and objective
  - Social anxiety
    - State and trait
  - AS

## Methods

## Participants

- 42 participants from University of Regina
- 31 women, 13 men
- Mean age = 25
- 34 Caucasian
- 32 full-time students

## Self-report measures

- Questionnaires:
  - Social Interaction Phobia Scale (SIPS) <sup>1</sup>
  - Anxiety Sensitivity Index – 3 (ASI-3)<sup>2</sup>
- Visual analogue scales (VAS):
  - Measure of state anxiety
  - Measure of perceived arousal
    - Heart rate
    - Sweating
    - Breathing rate

1: Carleton et al., 2009;  
2: Taylor et al., 2007

## Objective ANS measures

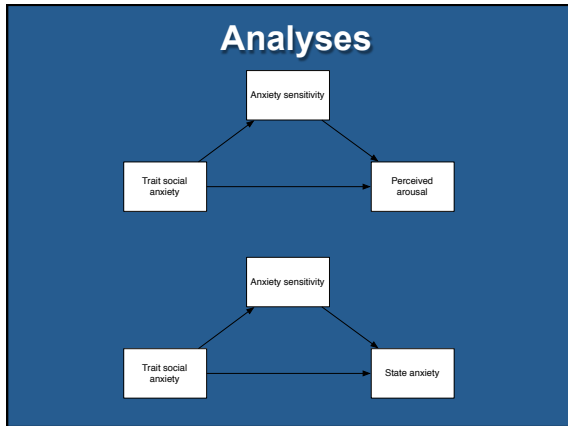
- Heart rate
  - Blood oximeter
- Skin conductance
  - Galvanic skin response amplifier
- Breathing rate
  - Respiratory amplifier and band

## Laboratory manipulation

- Baseline
- Three socially-oriented tasks
  - Speech task
  - Typing task
  - Hyperventilation
- VAS completed after each tasks

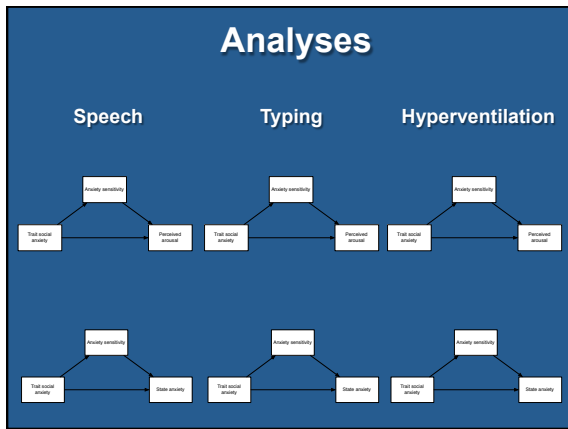
### Analyses

- Bivariate correlations
- Simple mediational model



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- Bivariate correlations
- Simple mediational model
  - Bootstrapped confidence intervals for indirect effects
- Perceived arousal factor
  - Summation of three perceived arousal VAS



### Results

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- State anxiety, perceived arousal, and objective arousal increased after baseline
  - (all  $p_s < .001$ ,  $\eta_p^2 = .38 - .79$ ).

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- SIPS and ASI-3 significantly correlated  
 $-r = .73, p < .001$
- SIPS and ASI-3 significantly correlated with majority of perceived arousal scores

### Results

	SIPS	ASI-3
<b>Perceived arousal speech</b>		
Heart rate	.43**	.28*
Sweatiness	.21	.22
Shortness of breath	.44**	.36*
<b>Perceived arousal typing</b>		
Heart rate	.42**	.36**
Sweatiness	.35*	.45**
Shortness of breath	.31*	.49**
<b>Perceived arousal hyperventilation</b>		
Heart rate	.30*	.37**
Sweatiness	.27*	.34*
Shortness of breath	.09	.33*

### Results

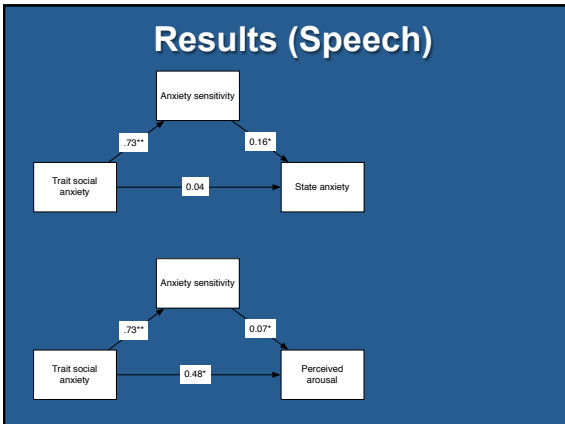
- SIPS and ASI-3 significantly not correlated with majority of objective arousal scores

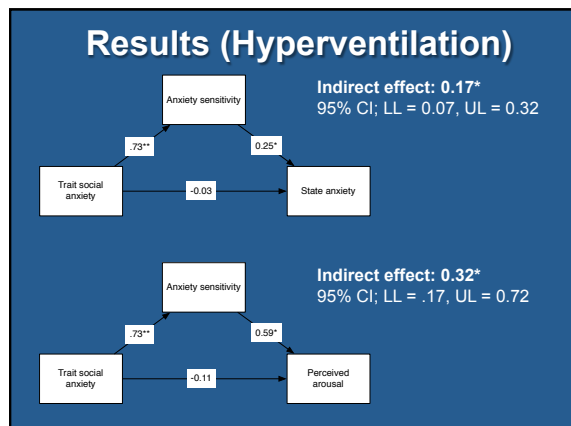
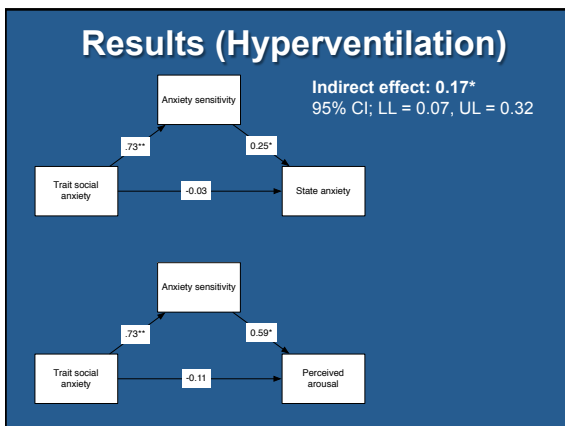
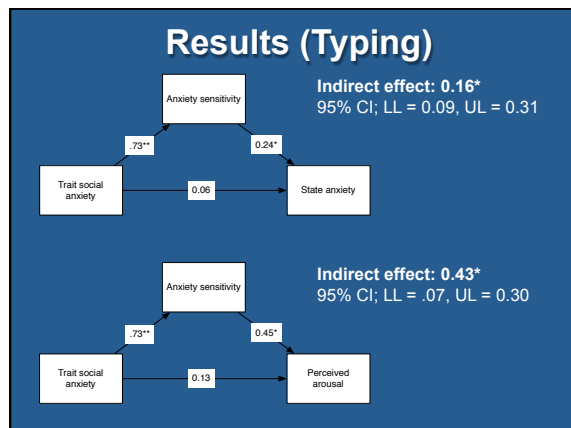
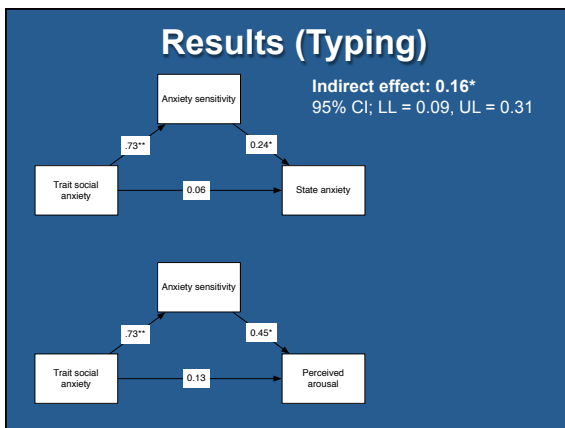
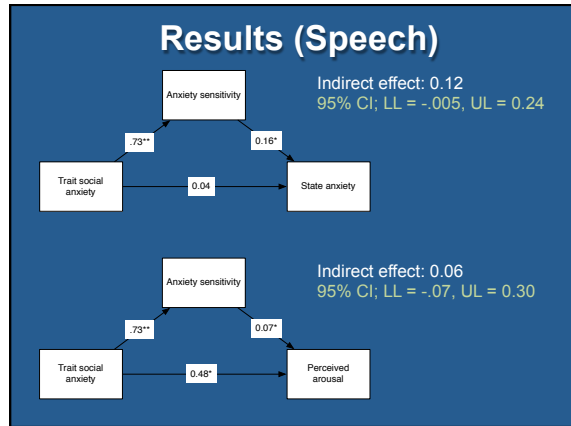
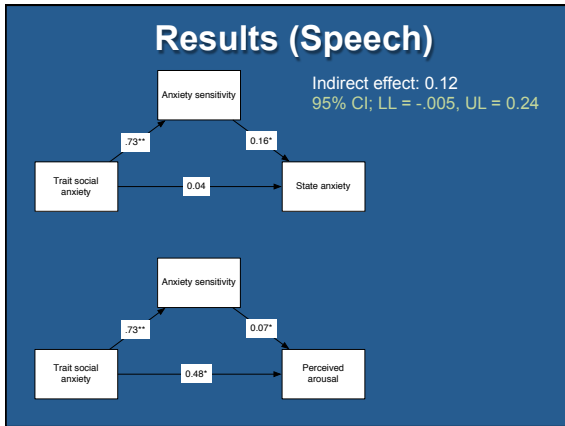
### Results

	SIPS	ASI-3
<b>Speech</b>		
Hear rate	0.179	0.164
Skin conductance	0.232	0.090
Respiration rate	0.200	0.199
<b>Typing</b>		
Hear rate	0.256	0.202
Skin conductance	.283*	0.164
Respiration rate	-0.123	0.005
<b>Hyperventilation</b>		
Hear rate	0.057	-0.035
Skin conductance	0.256	0.161
Respiration rate	-0.128	-0.163

### Results

- Every index of perceived arousal was correlated with every index of state anxiety





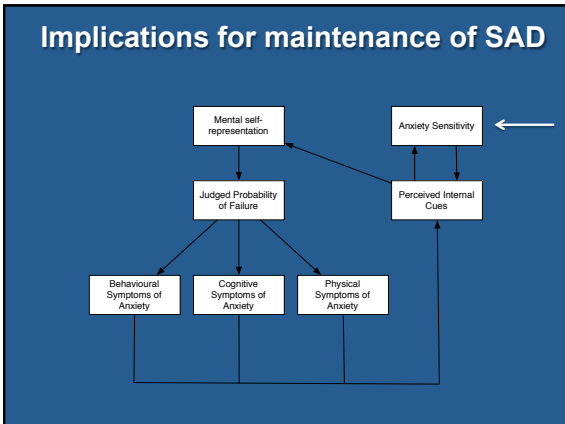
## Discussion

- ### Implications for maintenance of SAD
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  - AS - Expectation of failure
    - “I’m blushing like mad, there is no way I will get through this”
  - AS - Avoidance
    - “I don’t want to feel like that again”



## Implications for treatment

- Treatment focus
  - Perceptions of arousal rather than regulation of objective arousal
- Targeting AS
  - Cognitive restructuring
    - “They can tell I’m anxious, I’m sweating like crazy”
  - Interoceptive exposure

## Limitations

- Small, non-clinical, heterogeneous sample
- Inflation of VAS correlations
- Inability to infer causal relationships

## Conclusion

Thank you!

## Results

	3	4	5	6	7	8	9	10	11	12	13
PA speech											
3. Heart rate	–										
4. Sweattiness	.43**	–									
5. Shortness of breath	.71**	.34*	–								
PA typing											
6. Heart rate	.58**	.42**	.57**	–							
7. Sweattiness	.39**	.70**	.39**	.55**	–						
8. Shortness of breath	.26*	.28*	.56**	.59**	.50**	–					
PA hpvt											
9. Heart rate	.56**	.27*	.52**	.41**	.30*	.36**	–				
10. Sweattiness	.30*	.64**	.37**	.26*	.69**	.41**	.41**	–			
11. Shortness of breath	.30*	.40**	.15	.42**	.49**	.30*	.33*	.36**	–		
12. State anxiety speech	.64**	.44**	.48**	.59**	.54**	.38**	.48**	.27*	.63**	–	
13. State anxiety typing	.43**	.34*	.54**	.74**	.58**	.65**	.4**	.43**	.50**	.62**	–
14. State anxiety hpvt	.38**	.34*	.45**	.50**	.45**	.56**	.7**	.47**	.38**	.59**	.64**